

WHAT IS CLAIMED IS:

1. A seal-separator conjugation for a fuel cell which clamps a membrane electrode assembly sandwiching both surfaces  
5 of a polymer electrode membrane, comprising seals on a front surface and a rear surface of the separator at least at one end of the separator.

2. The seal-separator conjugation according to claim  
10 1, wherein said seal has a fitting construction fitted to a seal formed on a neighboring separator or a neighboring membrane electrode assembly.

3. The seal-separator conjugation according to claim  
15 1, wherein the seal formed on the front surface and the seal formed on the rear surface are made of different rubber materials.

4. The seal-separator conjugation according to claim  
20 3, wherein the seal formed on the surface of the separator at the air passage side is made of a rubber material having oxygen resistance and the seal formed on the surface of the separator at the coolant passage side is made of a rubber material having resistance to a coolant.

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5. The seal-separator conjugation according to claim

1, which possesses a seal portion for a communication pore, which coats the inside of the communication pore, and an outer circumference seal portion, which coats portions from the outer circumference of the communication pore to the outer  
5 circumference of the separator.

6. The seal-separator conjugation according to claim 5, wherein said separator and said seal portions are adhered by an insulating primer/adhesive.  
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7. The seal-separator conjugation according to any one of claims 1 to 6, wherein said seal has at least one pore originated from the mold for forming the conjugation in a vertical direction to the direction of the front and rear  
15 surfaces of the separator.

8. The seal-separator conjugation according to claim 7, wherein said pore is sealed with an insulating material.

20 9. A process for producing a seal-separator conjugation for a fuel cell having seals on a front surface and a rear surface of the separator at least at one end of the separator, which comprises:

a pre-forming stage for pre-forming a rubber material or  
25 rubber materials into pre-formed seals;

a sandwiching stage for inserting a separator between

said pre-formed seals; and

a vulcanizing stage for vulcanizing the pre-formed seals into the final seals while maintaining said pre-formed seals and said separator.

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10. The process according to claim 9, wherein said seal-separator conjugation possesses a seal portion for a communication pore, which coats the inside of the communication pore, and an outer circumference seal portion, which coats portions from the outer circumference of the communication pore to the outer circumference of the separator, wherein an insulating rubber composition is used to pre-form said seal portion for a communication pore and said outer circumference seal portion in said pre-forming stage; and wherein said separator and said pre-formed seals are adhered with an insulating primer-adhesive in sandwiching stage.

11. A process for producing a seal-separator conjugation for a fuel cell having seals on a front surface and a rear surface of the separator at least at one end of the separator, which comprises:

a pre-forming stage for pre-forming a rubber material or rubber materials into pre-formed seals within a mold having at least one supporting member for positioning said seal;

a sandwiching stage for inserting a separator between said pre-formed seals; and

a vulcanizing stage for vulcanizing the pre-formed seals into the final seals while maintaining said pre-formed seals and said separator.

5           12.    A seal-membrane electrode assembly conjugation for a fuel cell which is sandwiched by a separator and clamps a membrane electrode assembly, comprising seals on a front surface and a rear surface of the membrane electrode assembly at least at one end of the separator.

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          13.    The seal- membrane electrode assembly conjugation according to claim 12, wherein said seal has a fitting construction fitted to a seal formed on a neighboring separator.

15           14.    The seal-membrane electrode assembly conjugation according to claim 12, wherein the seal formed on the front surface and the seal formed on the rear surface are made of different rubber materials.

20           15.    The seal-membrane electrode assembly conjugation according to claim 14, wherein the seal formed on the surface of the membrane electrode assembly at the air passage side is made of a rubber material having oxygen resistance and the seal formed on the surface of the membrane electrode assembly at the  
25 coolant passage side is made of a rubber material having resistance to a coolant.

16. The seal-membrane electrode assembly conjugation according any one of claims 12 to 15, wherein said seal has at least one pore originated from the mold for forming the  
5 conjugation in a vertical direction to the direction of the front and rear surfaces of the separator.

17. A process for producing a seal-membrane electrode assembly conjugation for a fuel cell which is sandwiched by a  
10 separator and clamps a membrane electrode assembly, comprising seals on a front surface and a rear surface of the membrane electrode assembly at least at one end of the separator, which comprises:

a pre-forming stage for pre-forming a rubber material or  
15 rubber materials into pre-formed seals;

a sandwiching stage for inserting a membrane electrode assembly between said pre-formed seals; and

a vulcanizing stage for vulcanizing the pre-formed seals into the final seals while maintaining said pre-formed seals  
20 and said membrane electrode assembly.

18. A process for producing a seal-membrane electrode assembly conjugation for a fuel cell which is sandwiched by a separator and clamps a membrane electrode assembly, comprising  
25 seals on a front surface and a rear surface of the membrane electrode assembly at least at one end of the separator, which

comprises:

a pre-forming stage for pre-forming a rubber material or rubber materials into pre-formed seals within a mold having at least one supporting member for positioning said seal;

5 a sandwiching stage for inserting a membrane electrode assembly between said pre-formed seals; and

a vulcanizing stage for vulcanizing the pre-formed seals into the final seals while maintaining said pre-formed seals and said membrane electrode assembly.

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